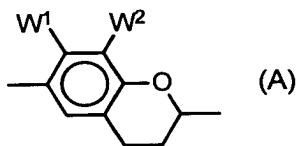


## CLAIMS

1. A liquid crystal display element:

having a structure comprising a pair of substrates, and a liquid crystal composition sandwiched between the substrates; comprising at least an alignment control layer, a transparent electrode, and a polarizing plate; and

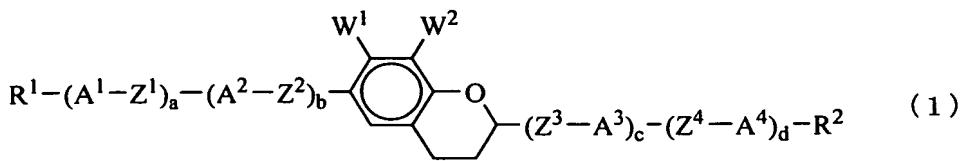
characterized in that the liquid crystal composition comprises at least one liquid crystal compound having a partial structure represented by general formula (A):



(wherein W<sup>1</sup> and W<sup>2</sup> each independently represents fluorine, chlorine, -CF<sub>3</sub>, -CF<sub>2</sub>H, -OCF<sub>3</sub>, or -OCF<sub>2</sub>H) and has a negative dielectric anisotropy.

2. A liquid crystal display element according to claim 1, wherein W<sup>1</sup> and W<sup>2</sup> represent fluorine.

3. A compound represented by general formula (1):



(wherein

$R^1$  and  $R^2$  each independently represents hydrogen, an alkyl group having 1 to 12 carbon atoms or an alkenyl group having 2 to 12 carbon atoms, in which one  $CH_2$  group or at least two  $CH_2$  groups that are not adjacent to each other may be substituted by oxygen or sulfur, or in which at least one hydrogen may be substituted by fluorine or chlorine,

$A^1, A^2, A^3$ , and  $A^4$  each independently represents a trans-1,4-cyclohexylene group (in which one  $CH_2$  group or two  $CH_2$  groups that are not adjacent to each other may be substituted by oxygen or sulfur), a 1,4-phenylene group (in which at least one  $CH$  group may be substituted by nitrogen), a 1,4-cyclohexenylene group, a 1,4-bicyclo[2.2.2]octylene group, a piperidine-1,4-diyl group, a naphthalene-2,6-diyl group, a decahydronaphthalene-2,6-diyl group or a 1,2,3,4-tetrahydronaphthalene-2,6-diyl group, in which hydrogen may be substituted by -CN or halogen,

$Z^1, Z^2, Z^3$ , and  $Z^4$  each independently represents  $-CH_2CH_2-$ ,  $-CH=CH-$ ,  $-CH(CH_3)CH_2-$ ,  $-CH_2CH(CH_3)-$ ,  $-CH(CH_3)CH(CH_3)-$ ,  $-CF_2CF_2-$ ,  $-CF=CF-$ ,  $-CH_2O-$ ,  $-OCH_2-$ ,  $-OCH(CH_3)-$ ,  $-CH(CH_3)O-$ ,  $-(CH_2)_4-$ ,  $-(CH_2)_3O-$ ,  $-O(CH_2)_3$ ,  $-C\equiv C-$ ,  $-CF_2O-$ ,

-OCF<sub>2</sub>-, -COO-, -OCO, -COS, -SCO-, or a single bond,

when A<sup>1</sup>, A<sup>2</sup>, A<sup>3</sup>, A<sup>4</sup>, Z<sup>1</sup>, Z<sup>2</sup>, Z<sup>3</sup>, and Z<sup>4</sup> respectively exist in plural, they may

be identical to each other or different from each other,

a, b, c, and d each independently represents 0 or 1, and

W<sup>1</sup> and W<sup>2</sup> each independently represents fluorine, chlorine, -CF<sub>3</sub>, -CF<sub>2</sub>H,  
-OCF<sub>3</sub>, or -OCF<sub>2</sub>H).

4. A compound according to claim 3, wherein in the general formula (1) R<sup>1</sup> and R<sup>2</sup> each independently represents an alkyl group having 1 to 7 carbon atoms or an alkenyl group having 2 to 7 carbon atoms (in which one CH<sub>2</sub> group may be substituted by oxygen), and W<sup>1</sup> and W<sup>2</sup> represent fluorine.

5. A compound according to claim 3, wherein in the general formula (1) A<sup>1</sup>, A<sup>2</sup>, A<sup>3</sup> and A<sup>4</sup> each independently represents a trans1,4-cyclohexylene group, a 1,4-phenylene group which may be substituted by at least one fluorine, or a 1,4-bicyclo[2.2.2]octylene group.

6. A compound according to claim 3, wherein in the general formula (1) Z<sup>1</sup>, Z<sup>2</sup>; Z<sup>3</sup>, and Z<sup>4</sup> each independently represents -CH<sub>2</sub>CH<sub>2</sub>-, -CH=CH-, -CF<sub>2</sub>CF<sub>2</sub>-, -CF=CF-, -CH<sub>2</sub>O-,

-OCH<sub>2</sub>-, -C≡C-, -CF<sub>2</sub>O-, -OCF<sub>2</sub>- or a single bond.

7. A compound according to claim 3, wherein in the general formula (1) the sum of a, b, c, and d is 1 or 2.

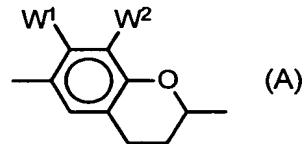
8. A compound according to claim 3, wherein in the general formula (1) R<sup>1</sup> and R<sup>2</sup> each independently represents an alkyl group having 1 to 7 carbon atoms or an alkenyl group having 2 to 7 carbon atoms (in which a CH<sub>2</sub> group may be substituted by oxygen), W<sup>1</sup> and W<sup>2</sup> represent fluorine, A<sup>1</sup>, A<sup>2</sup>, A<sup>3</sup>, and A<sup>4</sup> each independently represents a trans-1,4-cyclohexylene group, a 1,4-phenylene group which may be substituted by at least one fluorine, or a 1,4-bicyclo[2.2.2]octylene group, Z<sup>1</sup>, Z<sup>2</sup>, Z<sup>3</sup> and Z<sup>4</sup> each independently represents -CH<sub>2</sub>CH<sub>2</sub>-, -CH=CH-, -CF<sub>2</sub>CF<sub>2</sub>-, -CF=CF-, -CH<sub>2</sub>O-, -OCH<sub>2</sub>-, -C≡C-, -CF<sub>2</sub>O-, -OCF<sub>2</sub>-, or a single bond, and the sum of a, b, c, and d is 1 or 2.

9. A compound according to claim 3, wherein in the general formula (1) R<sup>1</sup> and R<sup>2</sup> each independently represents an alkyl group having 1 to 7 carbon atoms, an alkenyl group having 2 to 7 carbon atoms, or an alkoxy group having 1 to 7 carbon atoms, A<sup>1</sup>, A<sup>2</sup>, A<sup>3</sup>, and A<sup>4</sup> each independently represents a trans-1,4-cyclohexylene group, a 1,4-phenylene group, a 2-fluoro-1,4-phenylene group, a 3-fluoro-1,4-phenylene group, or

a 2,3-difluoro-1,4-phenylene group,  $Z^1$ ,  $Z^2$ ,  $Z^3$ , and  $Z^4$  each independently represents - $\text{CH}_2\text{CH}_2$ -, - $\text{CH}_2\text{O}$ -, - $\text{OCH}_2$ -, or a single bond,  $W^1$  and  $W^2$  represent fluorine, and the sum of  $a$ ,  $b$ ,  $c$ , and  $d$  is 1 or 2.

10. A compound according to claim 9, wherein in the general formula (1)  $A^1$ ,  $A^2$ ,  $A^3$ , and  $A^4$  each independently represents a trans-1,4-cyclohexylene group or a 1,4-phenylene group.

11. A liquid crystal compound which can be used in the liquid crystal display element according to claim 1, comprising a partial structure represented by general formula (A):

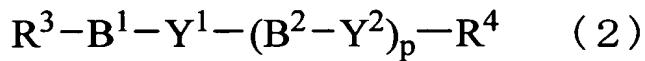


(wherein  $W^1$  and  $W^2$  each independently represents fluorine, chlorine, - $\text{CF}_3$ , - $\text{CF}_2\text{H}$ , - $\text{OCF}_3$ , or - $\text{OCF}_2\text{H}$ ).

12. A liquid crystal compound according to claim 11, which can be used in the liquid crystal display element according to claim 1, wherein in the general formula (A)  $W^1$  and  $W^2$  represent fluorine.

13. A liquid crystal composition comprising at least one liquid crystal compound according to claim 11.

14. A compound represented by general formula (2):



(wherein,

$R^3$  and  $R^4$  each independently represents hydrogen, an alkyl group having 1 to 12 carbon atoms or an alkenyl group having 2 to 12 carbon atoms, in which one  $CH_2$  group or at least two  $CH_2$  groups that are not adjacent to each other may be substituted by oxygen or sulfur, or in which at least one hydrogen may be substituted by fluorine or chlorine,

$B^1$  and  $B^2$  each independently represents a trans-1,4-cyclohexylene group (in which one  $CH_2$  group or two  $CH_2$  groups that are not adjacent to each other may be substituted by oxygen or sulfur), a 1,4-phenylene group (in which at least one CH group may be substituted by nitrogen), a 1,4-cyclohexenylene group, a 1,4-bicyclo[2.2.2]octylene group, a piperidine-1,4-diyl group, a naphthalene-2,6-diyl group, a decahydronaphthalene-2,6-diyl group or a 1,2,3,4-tetrahydronaphthalene-2,6-diyl group, in which hydrogen may be substituted by

-CN or halogen,

$Y^1$  and  $Y^2$  each independently represents -CH<sub>2</sub>CH<sub>2</sub>-, -CH=CH-, -CH(CH<sub>3</sub>)CH<sub>2</sub>-,  
-CH<sub>2</sub>CH(CH<sub>3</sub>)-, -CH(CH<sub>3</sub>)CH(CH<sub>3</sub>)-, -CF<sub>2</sub>CF<sub>2</sub>-, -CF=CF-, -CH<sub>2</sub>O-, -OCH<sub>2</sub>-,  
-OCH(CH<sub>3</sub>)-, -CH(CH<sub>3</sub>)O-, -(CH<sub>2</sub>)<sub>4</sub>-, -(CH<sub>2</sub>)<sub>3</sub>O-, -O(CH<sub>2</sub>)<sub>3</sub>-, -C≡C-, -CF<sub>2</sub>O-, -OCF<sub>2</sub>-,  
-COO-, -OCO, -COS, -SCO-, or a single bond,

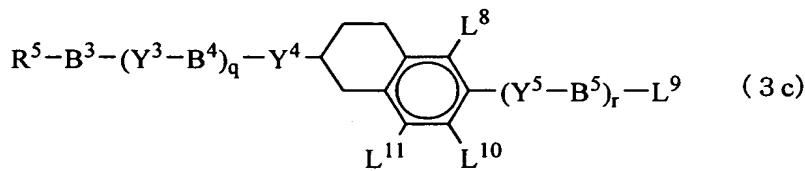
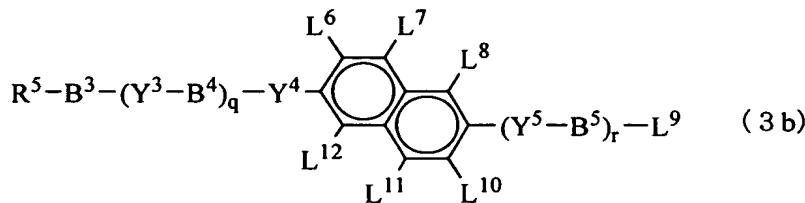
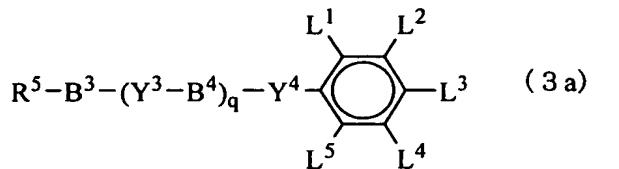
when  $Y^2$  and  $B^2$  respectively exist in plural, they may be identical to each other  
or different from each other, and

p represents 0, 1 or 2).

15. A liquid crystal compound which can be used in the liquid crystal display element according to claim 1, comprising at least one liquid crystal compound according to claim 14.

16. A liquid crystal composition according to claim 13, comprising at least one liquid crystal compound according to claim 14.

17. A liquid crystal composition according to claim 13, comprising at least one compound selected from the group consisting of general formula (3a), general formula (3b), and general formula (3c):



(wherein

$R^5$  represents hydrogen, an alkyl group having 1 to 12 carbon atoms or an alkenyl group having 2 to 12 carbon atoms, in which one  $CH_2$  group or at least two  $CH_2$  groups that are not adjacent to each other may be substituted by oxygen or sulfur, or in which at least one hydrogen may be substituted by fluorine or chlorine,

$B^3$ ,  $B^4$ , and  $B^5$  each independently represents a trans-1,4-cyclohexylene group (in which one  $CH_2$  group or two  $CH_2$  groups that are not adjacent to each other may be substituted by oxygen or sulfur), a 1,4-phenylene group (in which at least one CH group may be substituted by nitrogen), a 1,4-cyclohexenylene group, a 1,4-bicyclo[2.2.2]octylene group, a piperidine-1,4-diyl group, a naphthalene-2,6-diyl group, a decahydronaphthalene-2,6-diyl group or a 1,2,3,4-tetrahydronaphthalene-2,6-diyl group, in which hydrogen may be substituted by

-CN or halogen,

$Y^3$ ,  $Y^4$ , and  $Y^5$  each independently represents -CH<sub>2</sub>CH<sub>2</sub>-, -CH=CH-, -CH(CH<sub>3</sub>)CH<sub>2</sub>-, -CH<sub>2</sub>CH(CH<sub>3</sub>)-, -CH(CH<sub>3</sub>)CH(CH<sub>3</sub>)-, -CF<sub>2</sub>CF<sub>2</sub>-, -CF=CF-, -CH<sub>2</sub>O-, -OCH<sub>2</sub>-, -OCH(CH<sub>3</sub>)-, -CH(CH<sub>3</sub>)O-, -(CH<sub>2</sub>)<sub>4</sub>-, -(CH<sub>2</sub>)<sub>3</sub>O-, -O(CH<sub>2</sub>)<sub>3</sub>-, -C≡C-, -CF<sub>2</sub>O-, -OCF<sub>2</sub>-, -COO-, -OCO, -COS, -SCO-, or a single bond,

$L^1$ ,  $L^2$ ,  $L^4$ ,  $L^5$ ,  $L^6$ ,  $L^7$ ,  $L^8$ ,  $L^{10}$ ,  $L^{11}$ , and  $L^{12}$  each independently represents hydrogen or fluorine,

$q$  and  $r$  each independently represents 0, 1, or 2, provided that the sum of  $q$  and  $r$  is no more than 2, and

$L^3$  and  $L^9$  each independently represents hydrogen, fluorine, chlorine, -CN, -CF<sub>3</sub>, -OCH<sub>2</sub>F, -OCHF<sub>2</sub>, -OCF<sub>3</sub>, -CH<sub>2</sub>CF<sub>3</sub>, or the same meaning as  $R^5$ ).

18. A liquid crystal composition according to claim 13, wherein a content ratio of the liquid crystal compound according to claim 11 is 2 to 30% by mass.

19. A liquid crystal composition according to claim 13, wherein a dielectric anisotropy value is no more than -0.2.

20. A liquid crystal display element according to claim 1, wherein its drive system is

an active matrix system.

21. A liquid crystal display element according to claim 1, wherein a liquid crystal alignment regulated by the alignment control layer is vertical to a surface of the substrate.